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ABSTRACT

Writers construct meaning when they compose texts, and readers construct meaning when they understand and interpret texts. Building meaning through reading entails organizing, selecting, and connecting. Readers use previously acquired knowledge to operate on textual clues, organizing mental representations that include material they select from the text and connect with material they generate. This constructivist characterization of the reading process extends also to literate acts in which people are writers as well as readers: those acts in which they compose texts by drawing from textual sources. To meet their discourse goals, writers perform textual transformations associated with the operations of organizing, selecting, and connecting as they appropriate source material for uses in different communicative contexts. They dismantle source texts and reconfigure content they select from these sources, and they interweave the source material with content they generate from stored knowledge. Various transformations occur through reading and writing, and writers need to think about tasks in ways that will transform extant texts. (Two figures are included; 106 references are attached.) (Author/RS)

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Center for the Study of Writing

Technical Report No. 47

TRANSFORMING TEXTS: CONSTRUCTIVE PROCESSES IN READING AND WRITING

Nancy Nelson Spivey

February, 1991

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University of California
Berkeley, CA 94720

Carnegie Mellon University
Pittsburgh, PA 15213

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Abstract

This article considers the complex processes involved in readers and writers' construction of textual meaning: how people construct meaning *from* texts through reading and *for* texts through writing. Building meaning through reading entails *organizing*, *selecting*, and *connecting*. Readers use previously-acquired knowledge to operate on textual cues, organizing mental representations that include material they select from the text and connect with material they generate. This constructivist characterization of the reading process extends also to literate acts in which people are writers as well as readers, those acts in which they compose texts by drawing from textual sources. To meet their discourse goals, writers perform textual transformations associated with the operations of organizing, selecting, and connecting as they appropriate source material for uses in different communicative contexts. They dismantle source texts and reconfigure content they select from these sources, and they interweave the source material with content they generate from stored knowledge. This article describes the kinds of transformations that occur through reading and writing, and proposes a way to think about tasks that invite writers to transform extant texts. Theoretical issues are raised, and suggestions are made for further research.

TRANSFORMING TEXTS: CONSTRUCTIVE PROCESSES IN READING AND WRITING

Nancy Nelson Spivey
Carnegie Mellon University

Writers construct meaning when they compose texts, and readers construct meaning when they understand and interpret texts. Constructivity is quite apparent in writing because the writer creates a visible product, a text or fragments of a text that did not exist before, as he or she attempts to meet discourse goals. The writer does so, however, by also building something that is not visible, a mental representation of meaning (Flower & Hayes, 1984; Witte, 1985)—a cognitive construct that has been described metaphorically as a "textual world," a "configuration of concepts and relations" (Beaugrande & Dressler, 1981, p. 4). In the other process of literacy, reading, a person also builds a representation of meaning in response to discourse goals, using previously-acquired knowledge to operate on, and to embellish, the minimal cues provided by the text (Anderson & Pearson, 1984; Kintsch & van Dijk, 1978; Spiro, 1980). A reader strives, as a writer does, to create a representation that is not only internally coherent, in that it makes sense and hangs together, but is also externally coherent, in that it is appropriate for the communicative context. As I have discussed elsewhere (Spivey, 1987), three operations seem central to this complex process of constructing meaning from text: *organizing*, *selecting*, and *connecting*. The reader organizes textual meaning, selects textual content for the representation, and connects content cued by the text with content generated from previously-acquired knowledge.

In this article I apply these constructivist notions to literate acts that involve the making of meaning through both processes, reading and writing, operating in concert. When *composing from sources*, readers are also writers, transforming source texts to create new texts (Spivey & King, 1989). In using other texts to create a text—which may be an argument, a report, a critique, a summary, a proposal, or any of a number of other kinds of texts—a writer employs the constructive operations of organizing, selecting, and connecting to build meaning. The writer organizes semantic content that he or she selects from the sources and connects with content generated from the knowledge store. Although, in a broad sense, most, if not all, writing might be considered "composing from sources" (since no text is truly original), I am using the phrase for instances when writers draw *directly* from other texts, instances when the prior texts are knowable and traceable and when those prior texts might be compared with the new texts created from them. In these acts, the writer has two kinds of knowledge sources: what is available in the immediate source texts and what can be generated from previously-acquired knowledge in long-term memory. Of course, much of the knowledge in long-term memory comes from experiences with other texts. A person's knowledge base is built, in part, from the reading that he or she has done—all those prior texts encountered in what some literary theorists call the "intertext" (e.g., Miller, 1985), related texts whose identities are often untraceable by a researcher and frequently forgotten by the person who has internalized them. Both kinds of sources—the immediate source texts and knowledge gained from prior experience—can exert powerful forces on the way the writer organizes meaning, the selections that are made, and the elaborations and inventions that are generated.

When we consider what transpires in an act of composing from sources, we might first envision a two-step procedure, reading and *then* writing. If we did so, however, we would be ignoring the influence that writing can have on the reading process—influence so strong that boundaries between the two processes tend to blur. When writers compose from sources, reading and writing processes blend, making it is difficult, if not impossible,

to distinguish what is being done for purposes of reading from what is being done for purposes of writing. Although we see evidences of organizing, selecting, and connecting, we cannot often say whether a writer performs a certain operation to make meaning *of* the text that is read or to make meaning *for* the text that is being written. Let me use some examples of different writers composing from sources to illustrate how these operations that may seem to be components of the *reading* process can be viewed as components of the *writing* process as well, how *comprehending* is also *composing*.

Suppose a social historian, a specialist in working-class history, is writing a piece on why the American working class did not generate a strong socialist movement. She is using as a source one of the manifestos issued in conjunction with the railroad strikes of 1877. Then suppose a sportswriter freelancing for a sports magazine is writing an article comparing the run-and-shoot offense in football with the more traditional wishbone offense and is drawing some information from Ellison's *Run and Shoot Football: The Offense of the Future* (1984). And, finally, suppose a sophomore taking a course in developmental psychology is writing a research paper on the topic of autism. As one of his references, he is using an article from the journal *Child Development*. These writers approach their sources with ideas about their own texts, however well-formed or ill-formed those ideas may be, that include possible ways of organizing meaning. The historian may supply causal frames not used in the text as she reads her primary sources. The sportswriter may begin building contrastive patterns when reading about run-and-shoot offense and relating it to the other offense, and the student may be set merely to find in this source as in the others he is using, a collection of major subtopics, such as etiology and treatment, around which to organize the report he is writing. We cannot say whether the organization the writer imposes on the text content is associated with the reading process or the writing process; it is associated with both. The writer, when reading, is also selecting as well as organizing; he or she most likely attends selectively to content with potential relevance to the text being written, though that content may not be what is given most emphasis in the text. This selectivity, like organization, is an aspect of both reading and writing. In addition to organizing and selecting while reading the sources, the writer also connects textual content with what he or she already knows, generating content that adds to, that goes beyond, the content explicitly cued by the text. The writer, when reading, makes inferences, elaborations, perhaps thinking of examples or counter-examples, arguing with a particular point. This generative process can be thought of as inferential and elaborative processing for reading, but it is also invention for writing. The content generated becomes part of the mental representation of potential meaning for the piece that will be written and may become part of the actual text itself.

Because reading and writing processes blend and co-occur, it would be inaccurate to try to portray these intentional acts of composing from sources as a linear two-step kind of procedure in which a person reads a source text simply for comprehension in a text-driven kind of way before beginning the process of writing. Acts of composing from sources are hybrid acts of literacy (cf. Bracewell, Frederiksen, & Frederiksen, 1982) in which writing influences reading and reading influences writing.

This hybrid act of composing from sources is central to literacy, but it has been neglected in research. The past two decades have seen a surge of research contributing to our understanding of writing processes and reading processes, but little attention has been given to composing from sources, even though using texts as sources is a very common way of going about writing and a very common reason for reading. Perhaps this neglect is because of the hybrid nature of this kind of composing, since it actually cuts across two lines of research, which have their own paradigms and issues, and it does not fit neatly into one or the other. Writing research has focused almost entirely on composing situations in which the writer relies on topic information drawn exclusively from the store of previously-

acquired knowledge, producing what might be (but probably should not be) called "original" discourse (cf. recent reviews by Faigley, Cherry, Jolliffe, & Skinner, 1985; Humes, 1983). The only kind of source-based writing task that has been studied extensively is the writing of summaries of single texts (see review by Hidi & Anderson, 1986).

If we are to understand writing, we must examine common acts of composing in which writers, like the historian, sportswriter, and student used here as examples, draw from immediate sources as well as from stored knowledge to produce texts other than summaries. Reading research, in turn, has focused almost entirely on reading situations in which the reader reads a single text in isolation for the purposes of understanding it (reviewed in Spivey, 1987). The reader may be asked to write or verbalize a recall or respond to some questions, but those productions are usually for the purpose of demonstrating comprehension. If we are to understand *reading*, we must also investigate how it is manifested as readers, such as the three just mentioned, perform realistic acts that involve doing something with the knowledge gained. I see this as a necessary next step in reading research—studying reading when it is being done for purposes of writing.

Understanding the constructive processes in composing from sources is important not only for theory-building, as we seek to flesh out and interrelate our theories of reading and writing, but it is also important for pedagogical reasons. As programs in *writing across the curriculum* and *writing to learn* promote source-based writing as a powerful tool for learning the content of a text, educators and researchers are raising questions about how various tasks of composing from sources lead to different kinds of texts and thus different representations of meaning (Applebee, 1984; Langer & Applebee, 1987).

In this article, I propose a way to think about constructivity in these hybrid acts, how it is manifested and how it can vary. My approach is to take what is known about each operation—organizing, selecting, and connecting—in regard to reading for understanding, and then to examine its role in acts that involve composing from sources. We will consider what texts offer readers through cues for structure and content and what readers must contribute as they build meaning from those texts. And we will consider what people coming to textual sources with their own communicative agendas for writing their own texts can do *to* and *with* the sources—the transformations they perform—as they create their own meaning appropriate for this new context. When readers are also writers composing texts from texts, they can dismantle sources and reconfigure content that they draw from them. They can use varying kinds of criteria for selecting textual content, and they can generate much additional content on the basis of what they know and interweave it with source content to make a kind of textual tapestry. Our focus here will thus be on these operations so central to the shaping and reshaping of textual meaning. We'll consider organizing first, then selecting, and finally connecting.

Organization of Content

Organizing and the Construction of Meaning

When a reader understands or interprets a text, we assume that the reader's representation of the meaning of that text has an organization to it—a shape, a form, a kind of global coherence. It is not just loose bits of information. Rather, the content in the representation is organized into meaningful chunks composed of interrelated units of content—units that are held together by referential and logical links (cf. Frederiksen, 1979). In addition to these intra-chunk relations, there are inter-chunk relations, holding the chunks together at a global level. Researchers in the constructivist tradition dating back to Bartlett (1932) have been interested in how readers organize meaning—the relations that

they impose on content as they move through a text and the relations that remain in memory—and how the organization of readers' representations compares with the organization suggested by the texts they read (e.g., Meyer, 1975). Researchers have also been interested in how organization can influence the selection of content. Since the representation of meaning made from a text cannot be studied directly, one must make inferences about it by studying some kind of product, either written or oral, such as a recall, think-aloud protocol, or response to a prompt.

Texts provide cues to readers as to how the meaning might be organized, cues about the relations holding together the chunks and the relations within the chunks. Recent work in discourse analysis has revealed various kinds of organizational patterns used in text that identify the chunks and specify the relations among them. The relations associated with Grimes's rhetorical predicates, proposed back in 1975, have been influential in much of the discourse research (e.g., Hiebert, Englert, & Brennan, 1983; Meyer, 1975; Richgels, McGee, Lomax, & Sheard, 1987), though similar sets of relations have also been proposed (e.g., Beaugrande, 1980; Crothers, 1979; Mosenthal, 1985; Winterowd, 1970). Many informative reports and persuasive essays are organized at the global level with one, or some combination, of these patterns, such as cause-effect, comparison, problem-solution, question-answer, and collection (Kintsch & Yarbrough, 1982; Meyer, 1985). The combinations can vary. For instance, as Hoey (1986) demonstrated, the components of problem-solution texts can vary to such an extent that the problem-solution text cannot be considered to have a *structure*, in the strict sense of the word. Problem-solution patterns are not as distinct as they might seem, and they overlap with other patterns, such as question-answer. Some texts do, however, seem to have canonical forms; that is, they have conventional units (conventional in the sense that people familiar with the text type can predict what the chunks are) arranged in a conventional order (people can predict what will come first, what will follow, and so on, and can tell when that order is violated). An example of a canonical text type is the research report in psychology (American Psychological Association, 1983; Kintsch & van Dijk, 1978). A reader familiar with this kind of text can expect it to have the following chunks in the following order: *introduction*, *method*, *results*, *discussion*, and can expect the *method* section to have subunits, such as *subjects*, *materials*, *procedure*. The reader also knows that, when a researcher reports more than one study in a single text, each of the related studies will have *method*, *results*, *discussion*, and that there will be a *general discussion* at the end.

We can think of knowledge of text forms and ways of forming texts as part of the discourse knowledge that is used in both reading and writing (Hiebert et al., 1983; Meyer, 1982; Richgels et al., 1987). Another way to think of this knowledge, Coe (1987) suggested, is as "social memory," since the ways of patterning discourse can be standard kinds of responses to communicative situations, even prescribed and preferred forms of a discourse community. A writer uses this knowledge to generate form when composing a piece, crafting it, packaging it with cues, some subtle, some very explicit, in anticipation of the constructive processes a reader will use. As Nystrand (1986) put it, "[T]he shape and direction of discourse are configured by the communicative need of writers to balance their own purposes and intentions with the expectations of readers" (p. 36).

When reading, people organize text content as they build their representations of meaning. They use previously-acquired knowledge, including knowledge of discourse patterns, along with cues from the text to predict and discern form—to perceive (even create) the chunks in the textual content and relations between the chunks. For instance, let's say a reader approaches a newspaper editorial to learn the paper's stance on a particular issue. The text presents an unfavored view on the issue and then the favored view—the newspaper's view. The reader might use cues from the text as well as relevant topic knowledge and knowledge from prior experience with such discourses to construct a

representation that has two large chunks, unfavored and favored positions, interlinked with the overarching adversative pattern. If we asked the reader to recount what was read, shortly after reading it, that recall might match up fairly well structurally (in terms of relations and ordering) with the organization of the text.

In many studies conducted in discourse comprehension, this kind of structural isomorphism between texts and representations, especially as the representations are reflected in recalls, has been well documented for skilled readers. Study after comprehension study conducted in recent years affirms a strong predilection for skilled readers to use the same organizing relations and chunks that were used in the text they read—at least, they do when they produce recalls at an experimenter's request (McGee, 1982; Meyer, 1975; Meyer, Brandt, & Bluth, 1980; Meyer & Freedle, 1984; Richgels et al., 1987).[1] The effect is so strong for skilled readers that some instructional methods for unskilled readers focus on developing their conscious awareness of common patterns of discourse (e.g., Armbruster, Anderson, & Ostertag, 1987). The research also suggests that explicit signaling of the text structure, such as actually stating the kind of organizational pattern used (e.g., "the problem is," "the solution is"), does not make much difference for skilled readers when texts are well-structured (see review by Meyer, 1985). Skilled readers are able to infer organization without explicit marking, though signaling of organizational patterns can make reading easier for some unskilled readers (Marshall & Glock, 1978-1979; Meyer et al., 1980).

It is, of course, not always the case that people organize their representations of texts in a fashion that is consistent with patterns in the text. In fact, constructivist theory, with its emphasis on readers' knowledge structures, would predict structural transformations of textual content when readers' structures clash with those suggested by the text (cf. Spiro, 1980). Kintsch and van Dijk (1978) argued that other schemata can override a strategy that relies on the organizational patterns suggested by the text. Structural changes were of great interest to Bartlett (1932) when he asked his constructivist questions, wanting to see how his British subjects dealt with an unfamiliar kind of text, a North American Indian story that had no apparent connections between events. He found that the story became more coherent and that certain events became more consequential as his subjects retold it, since they were making it conform to their own schemata for stories and familiar situations.

What do we know about readers' reorganizing of textual content? We do have studies showing readers supplying organization to disorganized texts. In the scrambled-story research conducted during the late 1970s, readers reordered content from the texts they read, reorganizing them from a scrambled to a canonical form (e.g., Kintsch, Mandel, & Kozminsky, 1977; Mandler, 1978; Stein & Nezworski, 1978; Thorndyke, 1977). And, interestingly, there was in this research some evidence of readers' strategic control over organization, their ability to restructure, if that was required, or to retain the original, scrambled order, if that was required instead (Stein & Nezworkski, 1978). But what about readers' reorganizing natural (at least unscrambled) text? We actually know little about the kind of restructuring process that skilled readers undertake when they confront natural, even challenging, texts and build their own interpretations—the reordering and

[1]The assumption in this research is that the structure and content of the reader's mental representation of a text are reflected in the structure and content of the reader's recall of that text. Frederiksen (1986) provided a full discussion of this assumption. It is possible, though, that a reader responding to various discourse goals may form more than one representation of a text. Flower discussed this possibility, suggesting that during a single reading a reader may construct more than one representation. When asked to recall the text or answer questions about it, the reader may draw upon the representation that is most isomorphic to the source, if that is the one that seems appropriate for the context when the constructed meaning is put to use.

recombining that Schnotz, Ballstaedt, and Mandl (1981) saw readers doing in their German study. We also know little about the conditions under which readers supply new organizational patterns, the conditions under which they organize their representations in ways that differ from the patterns of the text. Some studies, such as Pichert and Anderson (1977), which is considered later in this article, examined the influence of frameworks other than text pattern, but focused on how the framework influenced the selecting rather than the ordering of content. However, one study of text understanding conducted by Meyer and Freedle (1984) that involved listening rather than reading serendipitously revealed rather dramatic structural changes on the part of some of the subjects, who generated different global patterns to hold together the content. Meyer and Freedle speculated that, because these people rejected the solution presented in a problem-solution text, they created different types of texts. There is, of course, a need for research investigating organizational transformations that readers make in their representations of texts when they approach texts with their own agendas and when they have tasks that invite restructuring. The laboratory-like contexts and rather brief texts used thus far in many studies have not invited changes.

Organizing: Textual Transformations through Composing

What happens to text organization when readers are also writers? As they compose from sources, writers discover and invent relations as well as content as they shape their mental representations and generate form for the texts they are creating. As in any kind of writing, organizing is a key element. When readers are also writers, using source texts to create their own texts, we should see evidence of structural transformations not often demonstrated in reading research, since writers are often reading to construct different meanings. Writers typically approach texts with intentions to create their own new texts, to make their own contributions (Kaufer & Geisler, 1989). Thus, preserving the overall organizational pattern of the source should not be so common in composing from sources, although writers *do* have that option.

And they frequently use that option in the writing of summaries. In fact, structural isomorphism is quite often the case in the writing of summaries, when the writer's purpose is to compress the text to its gist—its central and essential propositions (cf. Brown & Day, 1983; van Dijk, 1977, 1980; see review by Hidi & Anderson, 1986). When summary-writers attempt to create a miniature version of a text (we can call it the isomorphic summary), they follow textual cues, taking advantage of what the text offers structurally, and they appropriate the global organizational patterns of the source to frame the summary. Large-scale structural changes should occur only if the text has a canonical form and is not in the conventional order. When summaries are compared with source texts, the structural replications are often very apparent. For example, an abstract of a psychological research report follows the organizational pattern of the full text; a isomorphic summary of an essay with an adversative pattern retains that pattern. Summary writers engaging in this kind of text-driven process choose to preserve the global patterns of the text, putting the content in a more compact but nevertheless a similarly shaped package. Transformations are apparent in other aspects of meaning construction, as we shall see, but not organizing. However, I should acknowledge here that, although many summaries fit this description of structural isomorphism, not all do. For example, some summaries are shaped to meet the needs of special audiences, such as those in indexes intended for people looking for particular kinds of information (Ratteray, 1985). And in scientific writing there is not only the "report in miniature" type of summary but also another type of summary, one that serves as a kind of table of contents, indicating major topics included in the full text (Rathbone, 1972, p. 19).

On other common hybrid tasks, when not producing isomorphic summaries, writers do transform texts structurally. They have their own discourse goals that lead to

different ways of framing that content. Writers are also likely to be using more than one source text, and they must build a structure that incorporates material from diverse sources. They often dismantle source texts, chunking content in different ways; they reconfigure content from the sources in the act of appropriation, whether they are using one text or several. The structural transformations may consist only of reordering and recombining to create different chunks but retaining similar global patterns, or the transformations may also entail generating a different kind of organizational pattern.

I examined a recombining-reordering transformation in a study of report writing that involved source texts (Spivey, 1984). College students wrote reports about the armadillo that integrated information from three texts, all encyclopedia articles providing factual information. All source texts were organized with the loose kind of organizational pattern that Meyer (1975; 1985) called collection, in this case collections of attributes (e.g., size, species, habitat, progenitors), though the ordering and nature of the content differed across texts. Within the chunks of descriptive content were some propositions that were unique to a single text, some that were repeated in two, and some that were repeated in all three. On this task the writers' unique contributions came from providing an integrated presentation of the factual material, one text that structured the content that the writer selected from the composite available in the three sources. To learn about armadillos, a reader could read one text instead of three. Writers organized their texts by identifying recurring attributes across texts and by combining the content on similar attributes. They also combined content that was not closely related in the source texts by generating links to create larger chunks. For instance, one writer combined content on the armadillo's name, which means "little armored thing," with content on species and sizes by adding, "However, all armadillos aren't little."

Figure 1 illustrates the type of organization used in the reports. The student whose report is graphically presented here organized the text in a collection structure with 8 content clusters. In the illustration an individual content unit is represented by a single letter or a set of letters for the attributes, or themes, included in the unit: C, classification; T, teeth; H, habitat, S, species; X, armor; V, size; O, progenitors; F, flexibility; P, protection; D, diet; Q, timidity; L, legs; B, burrowing ability; R, reproduction; E, folklore; I, impact on humans. Some content units have a single theme; some have two or even three themes. I include the figure mainly to show where the writer made the kinds of integrative inferences that affected structure. In 6, after discussing armor, the writer generated the causal link, "The shield *is nature's way* of protecting the animal from flesheaters, *since it is harmless*, feeding only on insects and vegetable matter." (In these examples italics indicate information the writer added that was not offered by the source texts.) Thus, she integrated diet into the discussion of armor and protection. In 7, after linking the animal's timidity with its using its legs to burrow underground for protection, she added information that related burrowing ability to reproduction: "*This burrowing technique is also used when birth is about to take place.*"

The uniqueness of a particular writer's text was mainly in the way he or she chose to order and combine content, and to a lesser extent, the nature of the content he or she selected. Though all 40 writers used the same general kind of pattern, collection (as in the source texts), ordering and combining of content differed among all their texts, and all their texts differed structurally from any of the source texts. Each synthesis had the writer's structural stamp. This study also showed a link between reading ability and writing ability, especially in regard to text organization. When contrasted with the less accomplished readers, better readers produced texts with tighter structures. That is, they had larger content clusters in their collection structures because they developed their discussions of the topics they introduced and provided more linkages between units of content.

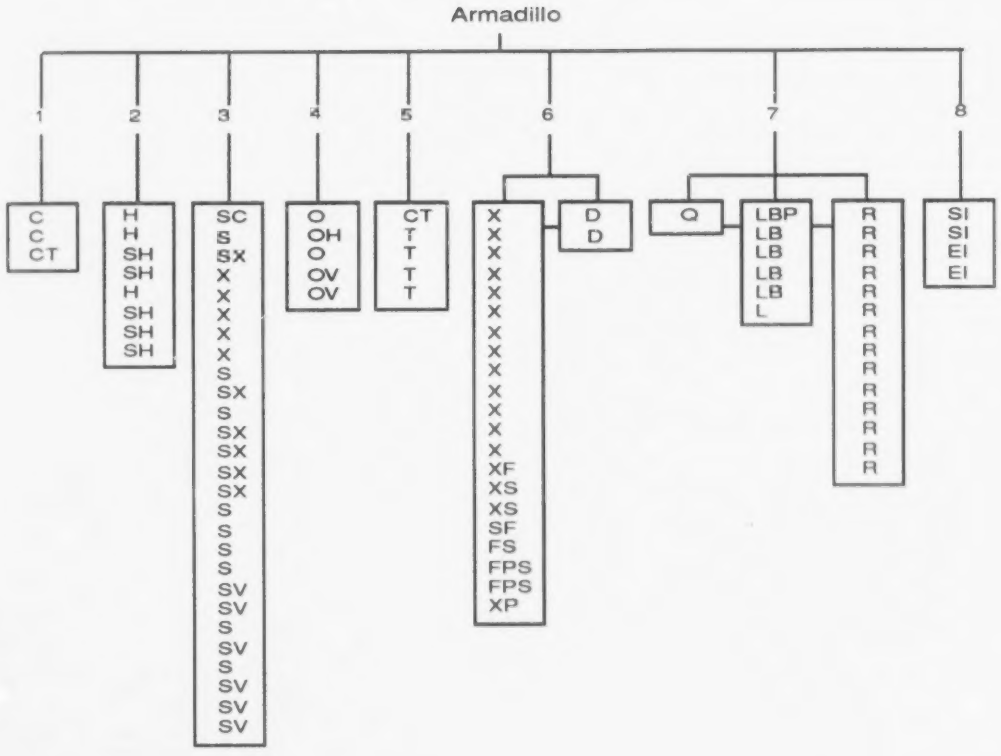

Figure 1. One writer's organization of the report.

Writers often approach texts with purposes that lead them to different ways of configuring semantic material, different ways of shaping the textual world. Not only do they recombine and reorder but they also generate different patterns to organize their texts. This kind of structural transformation was the focus of my study of the writing of comparisons (Spivey, 1991). College science-education students were asked to write comparisons of octopuses and squids, and they had as sources two descriptive texts, one on the topic of octopuses and one on the topic of squids, both of which, like the armadillo texts in the earlier study, were organized into collections of attributes. To perform the task, the writers dismantled the organization of the sources and shaped content into comparison patterns. They had to create a new global structure as well as to reorder and recombine content, and they had to move the descriptive content to a lower level, to embed it in their comparison structure. Figure 2 illustrates two of several ways the writers framed the texts. In the text represented by Organization I, the writer organized the comparison by dividing attributes (A) into those that were similar and those that were different for the two objects, octopus (O) and squid (S). The writer whose text is graphed as Organization II generated three macroattributes (MA)—appearance, internal features, and social behavior—to organize the descriptive material on specific attributes, providing information first for the octopus and then for the squid. Composition research is also beginning to show structural transformations being performed on a single text, as in Durst's (1987) study. He gave

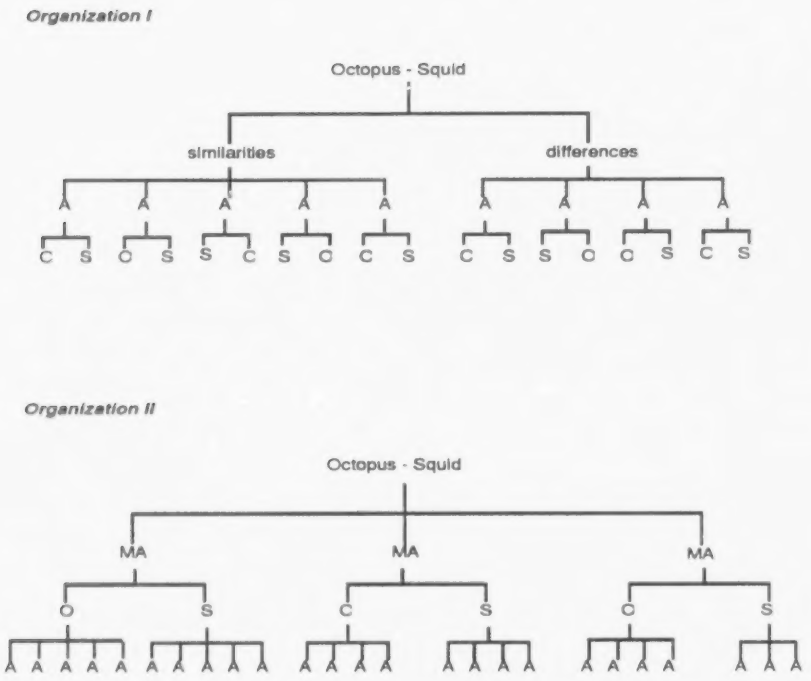

Figure 2. Two ways of organizing the comparisons.

some high school students the task of writing a thesis-support essay by drawing from a text that was organized as a chronology. When writers restructured, they generated the new pattern and moved the chronological content to a secondary level.

For the writers in my comparison study, organization was a major concern. After they wrote, when I gave them a questionnaire asking what were their major concerns in writing the paper, most responded with comments that included concerns about organization, and a number of them responded with comments that were *only* about organization. They mentioned wanting to accomplish such things as getting their points down in a logical order, providing a meaningful sequence, and sorting and classifying the information effectively.

These studies into the writing of texts from other texts provide some initial insights into the kinds of dismantling and reconfiguring that people do when they are in the role of writer. But there is much more we need to know about how people perform structural transformations on various tasks of composing from sources. We need to understand the complex transformations associated with writers' appropriation of source material for their own texts. One particularly important issue to pursue, I think, is the relationship between the discourse goals that writers set and the ways they shape their texts (cf. Flower, 1989; Schallert, 1987), since writers' intentions can entail particular kinds of organizational patterns (e.g., "I want to compare . . ." or "I want them to know the sequence of events"). In my studies I've begun examining transformations by looking at how writers perform some common writing tasks when expectations are fairly explicit and assignments elicit

certain purposes (and constrain others) on the part of writers. And on these tasks writers, in general, tend to do what they are asked to do: they generate new structures when invited to do so. But sometimes even when given a focused task inviting a particular way of framing discourse, some writers do the unexpected. For instance, in a developmental study of informational writing (Spivey & King, 1989), middle school and high school students wrote descriptive reports on the rodeo by drawing from three source texts, all presenting factual information about such things as events, sponsors, and stock. As in the first report-writing study (Spivey, 1984), all sources had a collection pattern at the global level holding together chunks of content. Though almost all students created their own collection patterns of the same type as in the sources—a conventional way to pattern the descriptive content they were dealing with—two of the 60 students in the study did something quite different from the others in organizing their reports. In attempting to meet the assignment, which was to inform adults and teenagers who were new to Texas and did not know much about the rodeo, one student wrote a piece of advice, organized into sequential steps, on how to look and act "cool" at the rodeo (e.g., put a can of Copenhagen in your jeans pocket), and the other wrote a comparison detailing similarities between a football game and a rodeo. Why did they perform so differently, organizing their texts in ways that were so different from the others? Did they have distinctively different goals that led to these different ways of planning and shaping their texts?

What happens when the expectations for what writers are supposed to do are not so clear? In this situation, they can vary considerably in determining what they want to accomplish and what they should do regarding organization of their texts. They vary in how they represent their task. Flower et al. (1990), using an "open" kind of writing prompt (much like many academic assignments), studied the way that college freshmen construed a task of writing on the topic of time management. Using think-aloud procedures, the researchers found much variability in how writers perceived their task and discovered that the way writers planned to structure their texts was linked to their task representation. Some saw their task as transmitting information and generated plans for summaries, which would replicate the organizational pattern of the source, whereas others saw their task as coming up with something original and planned texts with new patterns.

Selection of Content

Selecting and the Construction of Meaning

Constructing meaning from a text requires selecting as well as organizing content, since only a subset of what the text offers becomes a part of the representation. Some years ago, Gomulicki (1956) proposed that understanding a text entails an unconscious ranking of elements according to importance and eliminating the least important. It is, he suggested, like viewing an illustration and seeing some parts as figure and other parts as ground. In their texts, writers provide cues about what is figure and what is ground through their hierarchical placement of content, which is sometimes called *staging* (Grimes, 1975). Discourse analysis procedures applied to written texts demonstrate just how much information texts offer about what should be perceived as figure and as ground—cues about the relative importance of semantic content. In fact, text content can be easily parsed into small units of meaning—propositions or other content units—and those units can be arranged into text hierarchies, using some method of embedding, such as Kintsch's (1974; Kintsch & van Dijk, 1978) argument overlap or Grimes's (1975) and Meyer's (1975) hypotactic relations. In the parsing, it is apparent that the organizational pattern controls text hierarchy because it "define[s] which information is important . . . for the text as a whole" (van Dijk, 1980, p. 128). In folktale-like stories, for instance, the content with the most textual importance is the content that is most central to the structural elements of setting, goal, etc. In an expository text with a problem-solution pattern at the top level, the

content with the most textual importance is the content that is most central to the problem and the solution.

Very often what readers perceive as important when they construct meaning from a text is what writers have given prominence in the text; readers make their selections on the basis of what van Dijk (1979) called *textual relevance*. Researchers have forged a formidable body of work on the "levels effect," revealing skilled readers' ability to perceive and remember what is textually relevant (e.g., Cirilo & Foss, 1980; Johnson, 1970; McKoon, 1977; Meyer, 1975). Like sensitivity to text structure, this awareness of textual importance is linked to both general reading ability (McGee, 1982; Meyer et al., 1980; Taylor, 1980) and maturity (McGee, 1982). Better readers and more mature readers tend to make stronger use of the hierarchical nature of texts.[2]

Yet there are other bases for determining relevance and for selecting content that can, to some degree anyway, override text influence. What may seem to be ground when a text is read for textual relevance can become figure when it is read for another purpose or from another perspective. Van Dijk (1979, 1980) used the term *contextual relevance* to include relevance to the social situation and pragmatic relevance for accomplishing a particular communicative act. Sometimes the task induces a particular set, as demonstrated in Pichert and Anderson's (1977) oft-cited study that I mentioned earlier. In this study, Pichert and Anderson provided evidence of figure-ground patterning when they gave their subjects particular perspectives for reading texts and then studied the effect of the different frameworks on selectivity in recall. They had two narrative texts, an Island Text and a House Text, that could each be read from two perspectives—texts that are reminiscent of the ambiguous figures of Gestalt psychology, like the one that appears as a vase when viewed from one perspective or as faces when viewed from another. The Island Text could be read from the perspectives of either a florist (for information about flora) or a shipwrecked person (for information about the capacity of the island to sustain human life), and the House Text could be read from the perspectives of either a burglar (for information about valuables) or a homebuyer (for information about features of the house). The researchers found that the importance of an idea in terms of a given framework determined its likelihood of being recalled. What emerged as figure for the "florists," for example, was ground for the "shipwrecked people" and vice versa. However, subsequent studies have shown that the context for recalling as well as the context for encoding can influence relevance. If the other perspective gains importance at the time of recall, there can be some shifting of content (Anderson & Pichert, 1978; Baillet & Keenan, 1986).

Other times, it is not a task-inducing set that determines relevance as much as it is what the reader brings in terms of beliefs, attitudes, motives. These criteria for selecting may be related to readers' cultural background (Steffensen, Joag-Dev, & Anderson, 1979), prior knowledge (Anderson, Reynolds, Schallert & Goetz, 1977), and/or some notion of "interestingness" (cf. Hidi & Baird, 1988; Kintsch, 1980), and may even be characteristic ways of responding to a particular kind of text (Hayes, Waterman, & Robinson, 1977). Bazerman (1985), for instance, studied selectivity on the part of physicists reading to keep up with their field, and he found that they often read texts piecemeal because relevance for them was what would fit into the frames of their ongoing work—what would "fill out or modify their schema of subject and field" (p. 11).

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[2]In much of the research, the way that mature, skilled readers perform (i.e., use textual relevance as the criterion for selecting content) is considered the ideal standard, and the way that young unskilled readers perform is considered inferior to that standard. There is some evidence, though, that young, unskilled readers are not necessarily idiosyncratic and haphazard in making their selections. They often seem to make selections using criteria that are simply different from the adult criterion (Luftig, 1983; Pichert, 1979).

Selecting: Textual Transformations through Composing

When composing from sources, writers select content from the textual sources for their representations and deem some of that content relevant for inclusion in their own texts. Sometimes they even give hints of the selective process as they mark sources with brackets, asterisks, stars, and underlinings, and take notes (Kennedy, 1985; Nelson, 1988; Spivey, 1984, 1991; Spivey & King, 1989). They use some principle or principles of relevance as they make selections.

What are these relevance principles that writers use? To ask Gomulicki's question, what makes some content emerge as figure and other content fade into the ground? One principle writers sometimes use, of course, is textual relevance. In some acts of composing from sources, particularly summary-writing to produce gists, we get clear evidence that writers are using the criterion of textual relevance, the criterion that readers demonstrate so often in reading comprehension studies. When writers summarize the texts of other writers to produce isomorphic miniatures, they use the hierarchical placement of content to determine its relative importance, since they are performing macroprocessing for a reader by deleting the more trivial and redundant information (cf. Brown & Day, 1983; van Dijk, 1977, 1980). In this kind of act, we see the connection between organization and the selecting of content: Writers select what is most important structurally, most fitting to the text plan already established. Working through a source and deleting some content while preserving other content is an early-blooming strategy in summarizing, as demonstrated in research showing writers as young as fifth grade using a copy-delete strategy when writing their summaries (Brown, Day, & Jones, 1983).

There also appears to be an *intertextual* criterion that writers apply when they have multiple sources and synthesize them to present general information on a topic. The writers in my report-writing study (Spivey, 1984) were selective in including content. Of the 277 content units available in the three sources, they averaged only 85 units in their reports. How did they select content? On this task they apparently did much selecting on the basis of repetition across texts as well as placement in the textual hierarchies. To study their selections, I determined a value for each content unit that they might select from the sources. The value was for intertextual importance, which I derived by combining values for the structural levels of the unit in all the sources in which it appeared. There was strong evidence that writers were making selections on the basis of an intertextual criterion, defined this way, especially the writers who were the better readers. The writers were more likely, for instance, to include a unit that appeared in all three texts, but played a moderately important role structurally in each, than a unit that was staged very prominently in the hierarchy of a single text. In the developmental study (Spivey & King, 1989), giving writers a similar kind of report-writing task, middle school and high school students also appeared to make selections on the basis of intertextual importance, which we defined in this study simply by repetition across texts because the sources tended not to have many levels in their hierarchical structures (Spivey & King, 1989). Many of the writers seemed to be consciously aware of this selection principle. When asked how they decided what to include, they said things like "If something is repeated in several articles, then it's obvious that it's important" (p. 20). In this study we found sensitivity to intertextual importance to be associated not only with reading ability but also with grade level. The older writers, like the writers who were better readers, were more likely to select content that was repeated across the sources.

Another kind of criterion that writers use is linked not to structural characteristics of the sources but to the configuration of meaning being built for the new text. Relevance of content is determined by its relation to an emergent structure as the writer transforms the source material into a different shape. What might seem to be ground if the source text is

read for purposes of understanding can become figure when writers approach it with other frameworks and criteria. In my study of the writing of comparisons (Spivey, 1991), writers did a kind of balancing act in selecting source content, searching for content that was parallel for the two topics of the comparison. They apparently determined relevance in terms of the forms they were building based on similarities and differences. As they read and wrote, they noted relevant content for octopuses and squids by marking it on the sources, by writing notations in the margins about similar or contrasting attributes in regard to internal systems, physical features, lifestyles, and by constructing written plans. Some plans even took the form of matrices lining up the matching content.

The research on reading and on composing from sources conducted thus far has demonstrated selection on the basis of textual relevance as well as evidence about other criteria that can override the textual criterion. As we continue to study complex acts of literacy, we will see some criteria linked to structure (of the new text as well as the source) but other criteria that are not, since writers' goals, which influence selection as well as organization, are multifaceted. We should see multiple criteria being used in concert. What happens, for instance, when males assume a feminist perspective in critiquing texts (cf. Showalter, 1987)? Do they retain their masculine views? If so, are both perspectives reflected in what they choose to critique? As research into selectivity progresses, we will learn more about social factors influencing selections from the intertext of related work, such as the use of citations to align oneself with certain people and to present one's own work favorably (Myers, 1985). We can study other sophisticated rhetorical moves related to selectivity. Latour's (1987) work, for example, suggested that in scholarly scientific writing, writers sometimes make it appear that they are summarizing (i.e., providing a gist of the text by using source text structure and textual relevance) in incorporating other writers' texts into their own when, in fact, they are restructuring those texts and selecting content to suit their own purposes. We can also track changes in relevance principles throughout the course of composing as the text evolves, to see how writers change their bases for selecting as they elaborate and reconceptualize their goals for their texts.

Connection of Content

Connecting and the Construction of Meaning

Besides organizing and selecting, a third operation in constructing textual meaning is one that I call *connecting*. This is the generating that the reader does in integrating what he or she already knows with the content explicitly cued by the text. As Bartlett (1932) said, understanding a text involves "the attempt to connect something that is given with something other than itself" (p. 227). Because of this kind of connecting with prior knowledge, reading is a generative as well as a selective process, and it results in a representation of meaning composed not only of some content that can be traced to the source text(s) but some that cannot. If we asked someone to read and later recall a text, that recall would include these additions (generated from previously-acquired knowledge) integrated with a subset of source material. Writers expect—even depend upon—readers to make inferences. When creating texts, writers make some assumptions about the knowledge that their readers will bring to the texts, what readers will be able to supply. This anticipation of a reader's cognitive state ("reading" the reader) and the ability to adapt a text accordingly is a kind of *social cognition* that seems to develop as writers gain maturity (Kroll, 1985; Rubin, 1984). The writer's role in this regard can be viewed as an obligation, part of a Gricean kind of contract in which the writer and reader agree to be cooperative. One way for the writer to be cooperative is to be informative but not *too* informative (Grice, 1975; cf. Nystrand, 1986; Tierney & LaZansky, 1983). There can be mismatches, of course, between what writers produce and what readers need and want. A text can give the reader too much of the burden of making what Kintsch and Vipond (1979)

call "resource-consuming" operations (cf. Schriver, 1987). The mismatch can work the other way too—not giving the reader enough of the burden. We all know the boredom that can come from reading a text that is overly explicit, almost insulting, in that it spells everything out too specifically. Nevertheless, even the most excruciatingly explicit text is full of implications, as we can see visibly if we parse it into a propositional text base, using a method of analysis such as Frederiksen's (1975b) or Kintsch's (1974; Kintsch & van Dijk, 1978; Turner & Greene, 1978), and note all the holes in the text base, the places where the reader is supposed to make inferences.

Bransford's early work using sentences (Bransford, Barclay, & Franks, 1972; Bransford & Franks, 1971), supported by numerous other studies, demonstrated that people add inferential material in comprehension and often cannot later distinguish between what they read and what they generated. For instance, in Bransford et al.'s (1972) study, when people represented meaning for the sentence, "Three turtles rested on a floating log and a fish swam beneath it" (p. 195), they also stored the inferred information that the fish swam beneath the turtles. Kintsch (1974), who extended work in inferencing to the understanding of texts, showed that people interweave generated material to make for a connected text base. People make various kinds of additions in reading as they build representations of texts; some additions are connective inferences, such as causal links, between units of content (Seifert, Robertson, & Black, 1985), and other additions actually fill in gaps in the content itself, when some information is not provided in the text but is important for understanding it (Bower, Black, & Turner, 1979). Readers do all this generating, adding some information that is necessary for comprehending the text but sometimes going well beyond what seems required by adding idiosyncratic material, on the basis of previously-acquired knowledge of various types, such as world knowledge (Black, 1985), topic knowledge (Pearson, Hansen, & Gordon, 1979), and discourse knowledge (Rumelhart, 1975). The added content may be something as small as supplying an agent for an action, when the writer has used the passive voice. Or it may be as large as generating a representation of another text in response to a literary allusion or a reference citation.

The question we must ask regarding added material is not "Do readers add?" but "Under what conditions do they generate more than other conditions as they build meaning from a text?" One condition for extensive generation is, of course, that the reader has relevant knowledge to fill the gaps—knowledge that can be drawn from long-term memory or can be invented. Another condition is that the gaps are there to be filled: to build a representation that is coherent within the discourse context, the reader *must* add material. The classic research in task-induced generation in comprehension, I think, was conducted by Frederiksen (1972, 1975a), who gave groups different "processing contexts" (tasks) for Dawes's Circle Island text. The text was about a controversy on the island between ranchers and farmers over a canal—a controversy so serious that it could lead to civil war and economic collapse. Among Frederiksen's tasks were a problem-solving task for one group, who had to construct plans for preventing civil war and for building the canal without being unfair to either the ranchers or the farmers, and a recounting task for another group, who had to retell what they remembered of the text. The tasks elicited differences in text representation, as revealed in recalls: more added material (relative to the total included) for those who had been solving a problem and more content explicitly cued by the text (relative to the total) for those who had been recounting it. Whereas the recounting task constrained people mainly to the textual content, the problem-solving task required moving beyond it. To perform that task—to construct meaning appropriate for that context—people *had* to "read" much into the text.

Connecting: Textual Transformations through Composing

Writers composing from sources produce texts that are blends of content from two kinds of knowledge pools: the source texts and their own stored knowledge. They transform source texts by interweaving content they generate on the basis of previously-acquired knowledge with content they select from those sources. Just as inferential and elaborative processing have been of interest to people studying constructivity in reading, the generative processes, often called *invention*, associated with composing are a major interest to people studying constructivity in writing (cf. Young, 1976, 1987). To what extent do writers generate content as they compose from sources? In the writing of isomorphic summaries, of course, writers add little to the source content, because their task is to reduce the text, not elaborate it. Nevertheless, even though summary-writers' major function is to reduce the text, they do *add* in the sense that they make inferences that become part of the summary. "Good" summary-writers, it seems, make two important kinds of inferences that compress the text: inferring a superordinate item to subsume items in a list and inferring a macroproposition to replace several propositions (Brown & Day, 1983; van Dijk, 1977, 1980). These generative operations are apparently more difficult to learn than the selection/deletion operations, and they are rather late blooming (Brown et al., 1983). According to Brown and Day (1983), these connecting kinds of operations are difficult for novice writers because they require writers to deviate most from copy-delete procedures. Inventing, the researchers explained, which is much easier for experts than it is for novices, "requires that the students add information rather than just delete, select or manipulate sentences already provided for them." And it is this that is "the essence of good summarization" (p. 12).

On other tasks that are not controlled by compression rules, we can see clearer evidence of the interplay between the two sources of content, source texts and the writer's stored knowledge. Both are sources of potentially relevant content—potentially relevant, that is, for what the writer wants to accomplish in the new text. If the source texts have ample relevant content to meet the demands of the task, as the writer construes it, the writer may not add much to the source material (cf. Durst, 1987; Langer & Applebee, 1987). In my synthesis studies, writers tended to rely heavily on source texts as they wrote informational reports for mature readers. Although they had fairly extensive topic knowledge, the writers in the report-writing study (Spivey, 1984) added content mainly to provide the links, which I mentioned earlier, between clusters of content. Even when writers restructured discourse in the comparison study (Spivey, 1991), they did not elaborate much. They often appeared to generate content to balance with the source material, as when one text provided a piece of information about one of the subjects of the comparison and the other text did not have parallel information about the other subject. For example, whereas the Squid Text discussed the squid's aggressiveness, the Octopus Text did not explicitly discuss whether or not the octopus was aggressive, though it did mention that the octopus tended to live a solitary life. Some writers inferred that the octopus was not aggressive and included that information to contrast with what they were saying about the squid.

In performing these tasks, writers reordered and restructured content as they shaped meaning but still relied on source texts for much content to fill the new configuration. The meaning they constructed was "new" in terms of the way content was shaped and positioned—the way the textual world was presented—despite the fact that much specific content could be directly linked to particular source texts. Even though we often think of composing in terms of the generation of content, extensive generation is not always required in an act of composing, especially when there is enough content available in sources that is relevant for accomplishing the task and meeting goals. And extensive generation of content is not always possible, even when it would be rewarded, if the writer

does not have relevant knowledge to draw on and thus *must* rely on source material (cf. Ackerman, 1989).

Under what conditions would we expect writers composing from sources to generate content extensively and include the generated material in their texts? In speculating about an answer to that question, I find the notion of form as heuristic to be useful (Coe, 1987; D'Angelo, 1975). A particular kind of task, such as the problem-solving task in Frederiksen's (1972, 1975a) comprehension study, can invite a particular form, a configuration that creates a certain amount of space to be filled in a particular way. For a representation to "fit" that communicative context, it must fill the space. If the textual sources have relevant material, writers may select content from them. If the sources do not have relevant content, writers are likely to generate content to fill the form if they have the knowledge base that allows them to do so. In this global kind of way, then, form can be heuristic. It can also be heuristic on a smaller, more local level. I believe that this was happening in my comparison study (Spivey, 1991) when writers generated content to fill in the deficient portions of the structure they were forming; they were providing balance in structuring similarities and differences for the two subjects of the comparison.

What happens then, one might ask, when writers do not have focused tasks that invite forms? What creates the heuristic space then? To answer these questions we must also eventually answer the question I raised earlier, when discussing organization, about the relation between goals and form. Writers, it seems, create their own heuristic spaces as they construct plans for meeting their discourse goals. Their intentions often include, among other things, the ways they will form their pieces and the kinds of content they will include.

To understand this generative process, future studies should, I think, pursue this notion of form as heuristic space, perhaps even by thinking of it in terms of *authority*. In a sense, a task, as perceived or set by the writer, can *authorize* generative processes because of the space it creates through suggesting a certain configuration of meaning (or it does not authorize much generating because it does not create the space). Another important factor that must be considered when we think about inclusion of generated material is the writer's own sense of authority in writing the piece—a perception that must be associated in some ways with the extent of the writer's knowledge but must also be distinct from knowledge level in certain ways (Geisler, in press; Greene, 1989). How is the writer's position in the discourse community for whom he or she is writing related to the appropriation of source material and generation of content?

Conclusion

In this article, I have outlined what I see as significant parameters and major issues in research on composing from sources. I have portrayed acts of composing from sources as a kind of interplay between what sources offer writers and what writers, drawing upon their knowledge of various types, can do to use and transform those texts as they construct their own meaning. Extant texts cue a potential way for writers to organize content for the new texts. And they offer a basis for selecting content because their authors have already staged the content, positioned it according to importance. Writers using those texts as sources for their own pieces bring knowledge and strategies that allow them to perform textual transformations as well as to follow those textual cues in constructing meaning. It is important, I think, not to paint this as a necessarily competitive kind of situation in which source texts exert their force and writers composing new texts exert theirs, ending up either actively resisting the source texts or passively reifying them. What we have in composing from sources is a set of choices writers can make about how those sources might be used. Writers using source texts bring knowledge and strategies that allow options and choices:

to appropriate the text structure or to restructure; to select content that was prominently placed in the source texts or to use some other criterion or criteria for selecting; to rely heavily on source content or to generate much content from what they already know—or can invent on the basis of stored knowledge. Elements within the contexts, the writers, and the sources influence how writers use these options. In performing different tasks, writers use the options differently and thus form different representations of meaning.

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